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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
CAPUTO, LISA M	
ART UNIT	**PAPER NUMBER**
2876	

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/920,752	MATSUMOTO, KEN	
	Examiner	Art Unit	
	Lisa M Caputo	2876	

-- The MAILING DATE of this communication appears on th cov r sheet with the correspond nc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *30* is/are allowed.

6)☒ Claim(s) *21-29 and 31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Amendment

1. Receipt is acknowledged of the amendment filed 27 June 2003.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 21-29 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Roehrman et al. (U.S. Patent No. 4,010,355, from hereinafter "Roehrman").

Roehrman teaches a semiconductor wafer having machine readable indices and a method of reading the wafer having all of the elements as recited in claims 21-29 and 31 of the instant application.

Regarding claim 21, Roehrman teaches an apparatus which reads a code (rows 18 and 20) formed on a substrate (12) which comprises a transfer unit with a holding member to hold and transfer the substrate (the wafer 12 is propelled along a suitable conveying means to a stop means at a read station), and a reading unit which optically reads a code formed on the substrate, at least a portion of which is arranged on the transfer unit (the wafer is stopped at a read station where it is scanned with the read head 30 and released from the read station to continue its travel, hence the stop means is holding the wafer and it is arranged on the transfer unit).

Roehrman discloses that turning now to the drawings, more particularly to FIG. 1, there is shown a plan view of the bottom surface 10 of a semiconductor wafer 12 having identifying indices 14 thereon in accordance with the invention. The semiconductor wafer 12 has a flat edge 16, provided in accordance with standard practice in the semiconductor device and integrated circuit manufacturing industry for orientation of the semiconductor wafer 12. The identifying indices are placed on the bottom surface 10 of the wafer 12 in a first row 18 and a second row 20 (as recited in claim 28 of the instant application). The first row 18 contains the actual identifying binary number for the wafer 12. The second row 20 contains the complement of the binary identification number in the first row 18, for error checking purposes. A sufficient explanation of the binary bar code (the code is a bar code as recited in claim 27 of the instant application) shown in FIG. 1 is contained in this application to allow understanding of the invention. For further details on the bar code employed, reference is made to a copending, commonly assigned application Ser. No. 448,171 filed Mar. 4, 1974 by Earlan Burk, entitled, "Bar Code Sequential Document Number Encoding With Error Checking," the disclosure of which is hereby incorporated by reference herein. In practice, a 28 position field is used for the identifying indices, although a lesser number has been shown in the drawing for purposes of clarity. The first position 22 and last position 24 of the field are used to mark the start and the end of the data stream representing the identifying number on the wafer, and always contain a bar, which indicates a binary 1. The absence of a bar at a field position in the code represents a binary 0. The second position 26 of the 28 position field is a parity bit. If a bar is located in any bit position in row 18, no bar should

appear at the corresponding position in line 20, as the sensed information would otherwise be cancelled out by the differential amplifier. The remaining 25 positions of the 28 position field contain the wafer identification number. This number of positions is chosen to be odd to insure that parity bit 26 is not 1 or 0 simultaneously in both rows. The bar code may be placed on the bottom surface 10 of the wafer 12 by any known method, such as a photoresist and etching step, or the like. In practice, it is preferred to use a laser scribing method, comparable to that employed for laser scribing for separation of the wafer 12 into individual semiconductor devices or integrated circuits. The wafer surface 10 may or may not contain an oxide over the scribed identifying indices. In practice, the bars 28 constituting the identifying code are 60 thousandths of an inch long, and spaced about 25 to 30 thousandths of an inch apart in the rows 18 and 20. The two rows are separated by 20 thousandths of an inch, and the row 20 is positioned 60 thousandths of an inch from flat edge 16 of the semiconductor wafer 12.

FIG. 2 represents a plan view of a preferred fiber-optic reading head 30 for use in the invention. The reading head 30 consists of a block 32 having a row 34 of light transmitting optical fibers 36 and a row 38 of light receiving optical fibers 40. In this embodiment, some optical fiber bundles 36 in row 34 are used to direct light to row 18 of the bar code and some other optical fiber bundles 36 are used to direct light at row 20 of the bar code. For example, the upper two bundles of row 34 can be used for row 18 of the bar code, and its bottom two can be used for row 20. The corresponding optical fiber bundles 40 in row 38 are used to detect light reflected from the corresponding row 18 or 20 of the bar code (as recited in claim 22 of the instant application). Since a

position in one row of the bar code which contains a binary 1 will always be opposite a position in the other row containing a binary 0, i.e., the absence of a bar 28, the optical fibers for the row not containing a bar provides a background signal for subtraction from the data signal. This means that the optical fiber bundles serving to provide the reference signal change depending on which row 18 or 20 contain a binary 1. The embodiment shown depends on reflected light from the surface 10 of semiconductor wafer 12. Alternatively, if light in the infra-red wave length which may be transmitted through the silicon wafer 12 is employed, the light transmitting fiber optic 36 would be placed on one side of the wafer 12, and the light receiving fibers 40 would be placed on the other side of the wafer (reading unit includes a code detecting portion and a code illumination portion as recited in claims 23-24 of the instant application). When using reflected light in the invention, essentially any wavelength can be used that is reflected by the wafer surface 10. Ordinary incandescent light is suitable. However, it is not necessary that a visible light wavelength be used.

In operation, the read head 30 is scanned along the bar code row 18 and 20, such as by means of a pneumatic cylinder and piston, or solenoid. With automated wafer handling, the semiconductor wafer 12 is propelled along a suitable conveying means, such as a conventional semiconductor wafer air slide to a reading station. A suitable stop means interrupts the wafer travel at the read station, the wafer is oriented by means of the flat edge 16, e.g., by rotating it with rollers until the flat 16 has reached the desired position (as recited in claim 25 of the instant application), the wafer is scanned with the read head 30, then the wafer is released from the read station to

continue its travel along the air slide (read unit is formed on transfer unit as recited in claim 26 of the instant application) (see Figures 1-2, col 2 line 27 to col 3 line 63).

Regarding claims 29 and 31, Roehrman teaches, in addition to the above limitations outlined, that there is a processing unit and method in the form of circuitry for processing the output of the read circuit 41 for input to a computer. Roehrman discloses that FIG. 3 shows a schematic of a simple read circuit 41 that can be used in this invention. The read circuit 41 has first and second photo transistors 42 and 44 which are positioned so that the light transmitting optical fiber bundles for each row 18 and 20 of the bar code 14 impinge on one of the photo transistors 42 or 44. Photo transistor 42 is connected to one input of differential amplifier 46 by means of line 48. Photo transistor 44 is connected to the outer input of differential amplifier 46 by line 50. Photo transistors 42 and 44 are also connected to ground through resistors 52 and 54 by means of line 56 and 58 respectively. Output line 60 from differential amplifier 46 is connected to input line 48 of the differential amplifier by means of line 62 and resistor 64 in a conventional manner. Resistor 66 of differential amplifier input line 48 provides a matching impedance to resistor 64. As discussed previously, for each position in the field of the data code 14, one of the photo sensors 42 will provide a background signal for subtraction from the data signal supplied by the other photo sensor. Differential amplifier 46 subtracts the background signal from the data signal, and the polarity of the resulting output pulse on output line 60 indicates which of the rows 18 or 20 of the identifying code 14 contains a binary 1 at the field position being sensed. This subtraction eliminates the DC portion of the background signal. In addition to a DC

component, the background signal will normally contain peaks caused by surface irregularities on the bottom surface 10 of the semiconductor wafer 12, scratches and the like. Integrating circuit 63 is provided to convert these peaks to a DC signal level for subtraction by differential amplifier 46. Output line 60 from differential amplifier 46 is connected to one input of integrating circuit 63 by means of line 64 and resistor 66. The output of integrating circuit 63 is connected to photo sensor 44 by means of line 68. Terminal 70, connected to the other photo sensor 42, provides an operating voltage for the read circuit 41. The operation of integrating circuit 63 is conventional and will therefore not be further explained.

FIG. 4 shows in block diagram form additional circuitry for processing the output of read circuit 41 for input to a computer. Output 71 of read circuit 41 is connected to logic circuit 72. Output 74 of logic circuit 72 is connected to shift register 76. Data output line 60 of read circuit 41 is connected to threshold circuit 78. Threshold circuit 78 is connected to shift register 76 by line 80. Shift register 76 contains as many data positions as the field of identifying code 14 in FIG. 1, i.e., 28. The first and 28th data positions 82 and 84, respectively, are connected to gate 86 by line 88 and 90 respectively. Output 92 of gate 86 forms one input of gate 94. Output 96 of shift register 76 forms the other input to gate 94. Output 98 of gate 94 is connected to a computer input. In operation of the circuitry of FIG. 4, the data from read circuit 41 is fed on line 60 to threshold circuit 78 for deletion of any remaining noise pulses in the data stream below the predetermined threshold, set to assure that only data pulses remain in the data stream. The data is supplied to shift register 76 by line 80. Logic circuit 72 is

provided to remove the signals from positions 1 and 28 of the identifying code field, which are provided as end markers. For this purpose, the appropriate signals are provided on line 71 to logic circuit 72 to produce the required output pulses on line 74. A binary 1 must appear in both data positions 1 and 28 of the identifying code in order for the identifying data to be supplied to the computer on line 98. For this reason, the corresponding storage positions 82 and 84 of shift register 76 are connected to gate 86 and a binary 1 must appear on both line 88 and 90 to produce an enabling pulse for gate 94 on line 92, thus supplying the identifying data on line 96 through gate 94 to output line 98 (see Figures 3-4, col 3 line 64 to col 5 line 6).

Allowable Subject Matter

3. Claim 30 is allowed.

4. The following is a statement of reasons for the indication of allowable subject matter:

The best art is provided by Hittner et al. (U.S. Patent No. 6,618,640, from hereinafter "Hittner"). Hittner teaches that process data (including that for exposure process as recited in claim 30 of the instant application) is associated with a remote identifier (e.g. barocde 109) and is used to do a processing run (i.e. data from the barcode dictates what the process will be etc.) of a semiconductor wafer.

Hittner discloses that turning now to FIG. 4, a flowchart representation of one embodiment of the method for utilizing remote identifier (e.g. barcode) systems in a semiconductor manufacturing environment, is illustrated. In one embodiment, the system 100 associates process data with a particular remote identifier (e.g. barcode)

109 [block 410]. The process data comprises the material identification, such as a type of material to be used in the semiconductor manufacturing process, the process type (i.e. photolithography process, etch process, etc.), the process recipe (i.e. the exposure time, the exposure size, the amount of ion implant, etc.), and feedback alterations that affect processing of semiconductor wafers. The process data associated with a remote identifier (e.g. barcode) 109 is generally stored into the remote identifier database 310. In one embodiment the remote identifier database 310 is located within the computer system 130. The remote identifier (e.g. barcode) 109 is then placed on a port 107, which is capable of holding a plurality of semiconductor wafers in a cassette 108 [block 420]. The semiconductor wafers placed in the port 107 are to be processed using the process data associated with the remote identifier (e.g. barcode) 109 that is placed upon the port 107. The port 107 that contains the remote identifier (e.g. barcode) 109 and the semiconductor wafers to be processed are sent downline towards a processing tool 120 for manufacturing processes (see Figure 4, col 6 line 59 to col 7 line 16).

However, this is not prior art since the Hittner patent was published 9 September 2003 and filed 11 April 2001 and the instant application claims priority to 4 August 2000. Hence, claim 30 contains allowable material.

Response to Arguments

5. Applicant's arguments with respect to claims 21-31 have been considered but are moot in view of the new ground(s) of rejection.

Examiner appreciates applicant's arguments and has provided new prior art in the form of Roehrman in order to overcome the limitations of the new claims 21-29 and 31.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: U.S. Patent No. 6,597,969 to Greenwald et al. which discloses a hospital drug distribution system that utilizes the scanning of barcodes.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ***Lisa M. Caputo*** whose telephone number is **(703) 308-8505**. The examiner can normally be reached between the hours of 8:30AM to 5:00PM Monday through Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee can be reached on 703-305-3503. The fax phone number for this Group is (703)308-7722, (703)308-7724, or (703)308-7382.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [**lisa.caputo@uspto.gov**].

All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

LMC
September 11, 2003

THIEN M. LE
PRIMARY EXAMINER